

**STATE OF CALIFORNIA  
REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL COAST REGION**

**STAFF REPORT FOR REGULAR MEETING OF September 7, 2007**

Prepared on August 15, 2007

**ITEM NUMBER: 11**

**SUBJECT: Waste Discharge Requirements Order No. R3-2007-0027, For  
Foxen Canyon Closed Class III Landfill, Santa Barbara County**

**KEY INFORMATION**

**Location:** Approximately 2 miles north of the town of Los Olivos at 4004 Foxen Canyon Road.  
**Type of Waste:** Non-hazardous municipal solid wastes.  
**Total Capacity:** 1.5 million cubic yards.  
**Remaining Capacity:** Closed with 82,000 cubic yards remaining capacity (July 2003).  
**Disposal:** Area-fill method.  
**Liner System:** 18.4 acres unlined  
**Groundwater Contamination:** Low-level volatile organic compounds (VOCs) in groundwater.  
**Existing Orders:** Waste Discharge Requirements Order No. 94-32, Waste Discharge Requirements Order No. 93-84 (Landfill Super Order), and State Water Resources Control Board Water Quality Order No. 97-03 DWQ (General Industrial Storm Water Permit)  
**This Action:** **Adopt revised Waste Discharge Requirements Order No. R3-2007-0027**

**SUMMARY**

Proposed Waste Discharge Requirements Order No. R3-2007-0027 ("Order" or "Order No. R3-2007-0027") for the Foxen Canyon Closed Class III Landfill ("Landfill"), updates and replaces existing Waste Discharge Requirements Order No. 94-32, adopted by the Water Board on April 8, 1994. Order No. R3-2007-0027 is included as staff report Attachment 1.

Significant updates to Order No. R3-2007-0027 include:

- Closure specific information, prohibitions, specifications, and provisions.
- Language and requirements consistent with California Code of Regulations Title 27, Solid Waste, effective July 18, 1997 (CCR Title 27), and 40 CFR Parts 257 and 258 Solid Waste Facility Disposal Criteria, Final Rule, as promulgated October 9, 1991 (40 CFR 257 and 258).

- Removes the Landfill from Waste Discharge Requirements Order No. 93-84, "Waste Discharge Requirements Amendment for all MSW Landfills in the Central Coast Region" (Landfill Super Order).
- Language and requirements consistent with other similar waste discharge requirements recently adopted by the Water Board.
- A finding documenting Executive Officer approval of an alternative final cover and monitoring requirements specific to the alternative final cover.
- A provision requiring an Evaluation Report to assess groundwater impacts and trends, evaluate corrective actions and monitoring, and propose modifications, if necessary.

The primary water quality benefits of this Order are to require closure constructions activities, including the final cover, be completed by December 31, 2007, post-closure maintenance for a minimum of 30 years and until waste no longer poses a threat to water quality, and periodic evaluation of groundwater impacts, trends, corrective actions, and monitoring.

## **DISCUSSION**

### **Landfill Description**

The Landfill is located in Santa Barbara County at 4004 Foxen Canyon Road, approximately 2 miles north of the town of Los Olivos, as shown in Order Attachment 1. Santa Barbara County operates the Landfill on 37.5 acres of land leased from the Chamberlin Trust. The disposal footprint comprises 18.4 acres with the remaining acreage devoted to access roads and transfer station facilities. Land adjacent to the Landfill is zoned for agricultural purposes and is generally used for rangeland and grazing. Nearby land is also used for oil extraction and crop cultivation. The closest residence is approximately 1 mile to the southeast.

### **Landfill History and Development**

The Landfill opened in 1970 to serve the residents of the Santa Ynez Valley. During its 33 years of activity, the site received waste from the cities of Solvang and Buelton, and the unincorporated towns of Los Olivos, Santa Ynez, Ballard and surrounding rural areas. The method of discharge at the Landfill was area-fill and cover.

The Landfill became inactive on July 8, 2003 with approximately 82,000 cubic yards of airspace remaining out of approximately 1.5 million yards total capacity. Upon ceasing solid waste disposal activities at the Landfill, Santa Barbara County opened up the Santa Ynez Valley Recycling and Transfer Station immediately north of the disposal area. The recycling and transfer station will continue to operate following formal closure of the Landfill. The closed Landfill's disposal footprint will be maintained as non-irrigated, low-maintenance, undeveloped open space.

### **Geology**

The Landfill is located at the southern end of the Coast Ranges geologic province within a structural block known as the Santa Maria Basin. The site is underlain by the Quaternary-age alluvium overlying the older Plio-Pleistocene Paso Robles Formation and the underlying sediments tend to dip towards the southwest at approximately five degrees

The Quaternary-age alluvium is limited to the south end of the Landfill. The alluvium consists of approximately 18 vertical feet of stiff, moist, silty clay, dark brown to black with some fine to coarse grained pebbles derived from the Paso Robles Formation. The majority of the alluvium beneath the disposal cell was removed prior to waste placement.

The Paso Robles Formation consists primarily of poorly sorted gravel, sand, and clay. Previous mapping of the Paso Robles Formation at the site performed by EMCON & Associates (1992) identified seven lithologic zones designated from youngest to oldest: A, A-1, B, C, D, E, and F. Zones A, A-1, C, and E are low permeability claystone units which act to restrict water movement between water-bearing B, D, and F Zones, respectively. Findings 19 and 21 of the proposed Order provide additional information on the various zones.

### **Hydrogeology**

The Landfill is located in the Santa Ynez Upland Groundwater Basin and the Paso Robles Formation under and adjacent to the Landfill is the primary source of drinking water in portions of Santa Barbara County. Groundwater at the site is primarily encountered at depths in excess of 225 feet with localized perched zones, within discrete layers of the Paso Robles Formation, at depths of approximately 150 feet. The perched groundwater generally flows towards the south and southeast.

### **Supply Wells**

There is one supply well onsite and several supply wells known to exist approximately 1 mile to the south.

### **Surface/Storm Water**

Onsite drainage flows around the northern and southern slopes of the Landfill toward the east. Runoff from these two areas passes through culverts to separate sedimentation basins. The water from the sedimentation basins then drains through a culvert to Foxen Canyon Creek, which in turn drains into Alamo Pintado Creek approximately three miles south of the site. Alamo Pintado Creek flows south into the Santa Ynez River.

The average annual precipitation is approximately 15.8 inches based on rainfall data collected at the landfill from 1995-2003. Nearby weather stations CIMIS #64 (1992-2003), SBC 218 (1951-2003), and SBS 233 (1955-2003) have recorded average annual precipitation of 19.9, 15.5, and 17.3 inches, respectively. The Landfill is not in the 100-year flood plain.

In addition to this Order, the Discharger is covered under a Statewide General Storm Water Permit. The Discharger performs storm water monitoring in accordance with the General Permit's Monitoring and Reporting Program and required storm water pollution prevention plan. Storm water samples are collected twice per year. The first sample is collected during the first hour of runoff from a storm event that occurs during scheduled operating hours and the second sample is collected during the first hour of runoff from a storm event that occurs during operating hours and was preceded by at least three working days without storm water discharge. Samples are analyzed for pH, total suspended solids, specific conductivity, oil and grease, and iron.

**Landfill Gas Control**

To control landfill gas and prevent offsite migration, Santa Barbara County monitors soil-gas probes and operates gas extraction wells located in the waste mass and along the south and southwest perimeter of the disposal area. Gas condensate resulting from landfill gas collection is stored in tanks and hauled as necessary to an appropriate wastewater treatment facility.

**Groundwater Monitoring**

The groundwater monitoring well network consists of five active groundwater monitoring wells: MW3, MW4, MW8, MW9, and MW10, and two lysimeters: LY1 and LY2. The wells are all believed to be downgradient of the disposal area. Historical wells MW6 and MW7 have been appropriately destroyed. Inactive wells MW2 and MW5 have consistently been dry and are no longer monitored. The proposed Order requires the Discharger to submit an Evaluation Report, which shall help determine the adequacy of the groundwater-monitoring network.

**Compliance History**

Prior to issuance of the previous Order No. 94-32, quarterly monitoring indicated the possible presence of volatile organic compounds in perched groundwater and the vadose (unsaturated) zone. The Discharger was required to perform an evaluation monitoring program and propose corrective action. The Discharger submitted a Proposed Evaluation Monitoring Program on March 10, 1995, and an Engineering Feasibility Study Corrective Action Plan on September 13, 1996. The reports indicated that landfill gas appeared to be impacting the vadose zone and perched groundwater. Proposed corrective action included the construction of a landfill gas collection system, with the possibility of a leachate cut-off barrier and/or passive gas vent in the form of gravel filled trench. To date only gas collection has been utilized as corrective action.

No notices of violation have been sent since adoption of the previous Order No. 94-32. In February 2004, an inspection by Water Board staff documented some interim cover slope erosion issues, which were promptly repaired by the Discharger. Overall, the Discharger is responsive to our information requests.

**Groundwater Degradation and Remediation Effectiveness**

Based on recent monitoring, gas extraction appears to have significantly reduced gas migration and the impact on the perched groundwater zone. Volatile organic compounds (VOCs) have consistently not been detected in the monitoring wells except for MW10. MW10 is occasionally dry and only thirteen samples have been collected since 1996. The VOC tetrachloroethylene (PCE) has been detected in eight of those samples with a high of 3.0 micrograms per liter (µg/L) in June 1998 and a most recent concentration of 1.3 µg/L in May 2005. The Maximum Contaminant Limit (MCL) for PCE is 5 µg/L.

The lysimeters attempt to monitor the downgradient vadose zone and have been inconsistent at providing enough water to analyze over the last three years. VOCs were regularly detected in LY1 prior to 1998 and inconsistently since, with detections for acetone (90 µg/L in March 1999), 1,4-dichlorobenzene (10.1 µg/L and 6.1 µg/L on June 2002 and September 2002, respectively), methyl tertiary-butyl ether (trace in March 2002), and dimethyldisulfide (24 µg/L and 13.3 µg/L in July 2000 and August 2001, respectively). Since 2003 only one sample was available from LY1 and it was nondetect for VOCs. VOCs were regularly detected in LY2 from 1998 until 2002 but the lysimeter has been dry since 2003. Reduced moisture in the vadose zone may be due in

part to the gas extraction system installed in 1997 and the interim cover, which was constructed in 2003.

The proposed Order requires the Discharger to evaluate the current monitoring network, corrective actions taken, and propose improvements, if necessary. Additionally, installation of the final cover will reduce the infiltration of water into the waste and minimize both production of leachate and landfill gas, thereby reducing the threat to groundwater quality.

### **Final Cover**

Pursuant to CCR Title 27, a final cover for the Landfill shall consist of the following components: a minimum two-foot thick foundation layer, a low hydraulic conductivity layer, consisting of one foot thick compacted clay with a hydraulic conductivity of  $1 \times 10^{-6}$  centimeters per second or less, and at least one foot of soil capable of supporting vegetation, resisting erosion, and protecting the underlying low hydraulic conductivity layer. An engineered alternative final cover is allowed if approved by the Executive Officer and the design satisfies the performance criteria in 40 CFR Parts 257 and 258, and CCR Title 27

The Discharger submitted an Alternative Final Cover Feasibility Study in February 2005, proposing an evapotranspirative final cover. An evapotranspirative cover is composed of specific soil types and thickness to favorably store and hold water, percolation through the cover is minimized by increased evaporation and plant uptake with an appropriate vegetative layer.

In May 2005, the Executive Officer approved the use of an engineered 4-foot evapotranspirative final cover for the Landfill including the use of existing interim cover (dependent upon Executive Officer approval and final construction quality assurance) for up to 1 foot of the final cover. In February 2006, the Executive Officer approved the use of existing interim cover for 1 foot of the final cover for a  $\frac{1}{4}$  acre area on the south embankment.

## **PROPOSED ORDER CONTENTS**

Proposed Order No. R3-2007-0027 updates regulatory language by referencing CCR Title 27, which combined and replaced Chapter 15 and California Waste Board regulations (Title 14). This proposed Order also reflects current Federal regulations; specifically, 40 CFR 257 and 258 (implementing Subtitle D of the Resource Conservation and Recovery Act). The proposed Order updates the Monitoring and Reporting Program to reflect current site conditions and groundwater monitoring and reporting requirements. The Order is divided into the following sections:

### **General Information**

Findings are included that document the site's owner and location, purpose of order, description and history, classification and waste type, geology and hydrogeology, surface water and groundwater, Basin Plan, CEQA, and additional general findings.

### **Compliance with other Regulations, Orders and Standard Provisions**

This section directs the Discharger to:

- Comply with all applicable requirements contained in CCR Title 27 and 40 CFR 257 and 258.

- Comply with the State Water Resources Control Board's general permit for industrial Storm water discharges, commonly referred to as "General Industrial Storm Water Permit."

### **Prohibitions**

The WDR includes discharge prohibitions applicable to a closed Class III waste disposal site.

### **Specifications**

The WDR includes specifications that the Discharger must meet and/or implement to comply with site specific aspects of CCR Title 27 and 40 CFR Sections 257 and 258 pertaining to solid waste disposal practices. The specifications include requirements for the final cover, including engineered alternatives; requirements for capacities of drainage facilities; and Discharger obligations for the duration of the post-closure compliance period.

### **Water Quality Protection Standard**

These standards define constituents of concern, monitoring parameters, concentration limits, monitoring points, points of compliance, and compliance period.

### **Provisions**

The WDR includes provisions that address the Discharger's responsibilities regarding landfill-related impacts to water quality and provide Water Board access to the Landfill and related reports, Order severability, discharge conditions, reporting, enforcement and implementation provisions.

## **MONITORING AND REPORTING PROGRAM (MRP) CONTENT**

### **Part I - Monitoring and Observation Schedule**

This section contains the following requirements: periodic routine site inspections, drainage system inspections, rainfall data collection, pollution control system(s), evapotranspirative cover performance monitoring, groundwater monitoring, storm water monitoring, analytical monitoring of groundwater and gas monitoring parameters and constituents of concern, and quarterly determination of groundwater flow rate and direction.

### **Part II - Sample Collection and Analysis**

This section establishes criteria for sample collection and analysis, methods to determine concentration limits, and specifies how these records shall be maintained. This section also establishes acceptable statistical and non-statistical methods the Discharger must use to perform data analysis, and outlines acceptable re-test procedures.

### **Part III – Reporting**

This section establishes formats and requirements that the Discharger must follow when submitting analytical data, semiannual reports, and summaries to the Water Board. It includes notification requirements, contingency responses and reporting requirements.

**Part IV - Definition of Terms**

This section defines a number of terms used in the MRP.

**ENVIRONMENTAL SUMMARY**

This project involves an update of Waste Discharge Requirements. These Waste Discharge Requirements are for an existing facility and as such are exempt from provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.) in accordance with Title 14, California Code of Regulations, Chapter 3, Section 15301.

**COMMENTS AND RESPONSES**

**(Prior to May 11, 2007 Board Meeting)**

**De Werd Family, Neighboring Landowner**

The De Werd Family, a neighboring landowner, submitted a comment letter dated March 16, 2007, which is included as staff report Attachment 2 and paraphrased below. Staff responses immediately follow the paraphrased comments.

**General Comment**

Our family lives approximately three quarters of a mile to the southeast of the Landfill, the caretakers of our property also live here, and our parents live in the home next to us. We are all reliant on domestic wells for water. Based on the history of VOC contamination at Santa Ynez Valley Landfills (Ballard Canyon, Santa Ynez Airport, and Foxen Canyon), we request that Santa Barbara County test our wells quarterly and share the results with us directly.

**Response**

Staff has modified Finding 30 of the WDR to note the additional nearby supply wells.

MW 10 lies 400 feet to the south of the Landfill. It is a shallow well (depth of 40.6 ft) and has been occasionally dry. In thirteen samples collected since 1996, tetrachloroethylene (PCE) has been detected eight times with a high of 3.0 µg/L in 1998 and most recent detection of 1.3 µg/L in 2005. The maximum contaminant level (MCL) for PCE is 5 µg/L. Due in part to the trace VOCs downgradient of the landfill, the proposed Order requires the Discharger to evaluate the current monitoring network, corrective actions taken, and propose improvements, if necessary.

In discussing this neighboring property owner's comment letter with Santa Barbara County Public Works, County staff stated that they had monitored a supply well downgradient of the Landfill and slightly upgradient of the De Werd property that has consistently been nondetect for VOCs. This information is available to the public, if requested.

Based on existing groundwater data and location of the supply wells discussed above, Water Board staff does not believe it appropriate to require monitoring of the De Werd supply wells at this time; however, staff intends to review the Evaluation Report required by the proposed WDR along with the other supply well data discussed by Santa Barbara County above. If necessary, the Discharger will be required to monitor offsite wells.

Prior to the May 11, 2007 Board Meeting, staff spoke by phone with Michelle de Werd regarding the above comments and responses. The De Werd Family is interested in the additional info that the County has on the nearby supply well and may request the County voluntarily monitor their well. Staff has relayed this request to the County, along with contact information, and will include the De Werd Family on any correspondence related to the Evaluation Report due in January 2008.

### **Santa Barbara County Environmental Health Services**

Santa Barbara County Environmental Health Services submitted several comments by email on March 22, 2007, which is included as staff report Attachment 3 and paraphrased below. Staff responses immediately follow the paraphrased comments.

#### **Comment No. 1**

The final sentence of Finding No. 13 should read "This option was abandoned on December 5, 2004, in response to the vocal opposition presented at local hearings by representatives from community groups."

#### **Response**

Staff agrees and has modified Finding No. 13 as recommended but without the word "vocal".

#### **Comment Nos. 2, and 3**

Regarding Provision No. 11 of the WDR, what would termination mean as the landfill is closed and no longer accepting waste? In addition, the nature of waste material is not expected to change, because no new waste is intended to be discharged at the new site.

#### **Response**

Provision No. 11 is standard language for WDRs regulating land disposal units including closed sites. The list of reasons to terminate or modify the WDRs is not exclusive. Staff believes termination though unlikely could result from the end of the Post-Closure Maintenance Period pursuant to Title 27 §20380(d)(1), §20410, and §20950, and 40 CFR 258.61 (a), this period is a minimum of thirty years (unless the County demonstrates that it qualifies for the exception discussed in the Response to Lu Comment 1, below) and until waste discharged at the Landfill no longer poses a threat to water quality. Also, if the closed Landfill were to experience a discharge (prohibited) the Water Board could choose to modify the WDR to address the discharge.

#### **Comment No. 4**

Regarding Provision No. 22.d. of the WDR, discharge prohibitions will not likely be violated, because no waste is intended to be discharged at the inactive site.

#### **Response**

Prohibition No. 1 of the WDR prohibits the discharge of waste at the Landfill, except as provided in an Executive Officer-approved Closure and Post-Closure Maintenance Plan for the Landfill. If the Discharger violates Prohibition No. 1, the County must notify the Executive Officer within 24 hours by telephone and 14 days in writing per Provision No. 22. "Discharges of waste" include any discharges of leachate that could impact groundwater, and not just new disposal of municipal waste at the landfill.



**Comment 5**

Provision No. 28 of the draft WDR requires submittal of a ROWD in the form of a JTD. However, this may be more than what is necessary for a closed site.

**Response**

Staff agrees and has modified the WDR to no longer require submittal of the JTD. However, the Evaluation Report is now required every five years to regularly update corrective actions or monitoring requirements as needed. We expect that that new site information or modifications may result in submittal of JTD or Closure Plan amendments.

**County of Santa Barbara Public Works Department**

The Discharger submitted a comment letter dated March 22, 2007, followed by an email on March 23, 2007. The letter is included as staff report Attachment 4 and both the letter and email are paraphrased below. Staff responses immediately follow the paraphrased comments.

**Comment Nos. 1, 2, 3, 4, 5, 11, 15, 16, and 17**

See staff report Attachment 4 for recommended minor edits or corrections.

**Response**

Staff has made the appropriate edits/corrections.

**Comment No. 6**

There is inconsistent use of Regional Board and Water Board throughout the WDR. For consistency, we recommend Regional Board as presented on the heading on Page 1.

**Response**

Staff has corrected the definition on Page 1 to define the California Regional Water Quality Control Board, Central Coast Region as the Water Board and has replaced Regional Board with Water Board throughout the WDR.

**Comment No. 7**

The MRP, Part I.E. Evapotranspirative Performance Monitoring requires five years of soil moisture monitoring and modeling of moisture conditions. County staff believe this is unnecessary and collection of this data is likely to lead to equivocal interpretations and will be costly and time consuming to S.B. County and the Water Board. The merits of the alternative cover should be based on design studies, infiltration modeling using site specific climatic data and soil properties, borrow source investigations, and construction quality assurance procedures, which have been previously submitted to, and approved by the Executive Officer in accordance with CCR Title 27, Section 21090.

**Response**

Staff disagrees; empirical site specific field data reapplied into the original (or improved) design model will aid the Discharger and/or the Water Board to understand the performance of the alternative final cover. If necessary, the Discharger would be able to address deficiencies prior to additional water quality impacts.

**Comment No. 8**

The MRP Part I.E.4. Soil Profile Data requires annual pot holing of the cover. Annual destructive testing of the cover is counter-productive and would compromise the function of the cover by disturbing the vegetation, interrupt pedogenesis (evolution of a productive soil horizon),

and disrupt compacted placement of the cover soils. We propose visual inspections of the cover.

**Response**

Staff agrees and has revised Part I.E.4. Soil Profile Data to require annual visual inspections over the cover.

**Comment No. 9**

The MRP Part I.E.5. Runoff requires flow measuring device and logger to measure and record runoff from the Landfill. County staff suggest omitting this item because measurement will not be useful in calculating percolation into the cover due to runoff and runoff entering the flow measurement device from areas other than the final cover area.

**Response**

Staff agrees and has deleted Part I.E.5.

**Comment Nos. 10, 12, and 13**

The MRP Part I.H.5 Analytical Monitoring Locations and Table 1 Monitoring Points require significant analytical surface water monitoring. Since the Landfill is closed, and no waste material shall be exposed to rainfall, the chances of impacting surface water with Table 2 and 3 parameters will be limited. County staff ask these sections be revised to apply to groundwater only. Surface waters shall continue to be monitored per the NPDES Industrial Stormwater General Permit.

**Response**

Staff disagrees; surface water analytical monitoring for Table 2 and 3 constituents is consistent with other closed landfills. The table has been updated to require surface water monitoring on semiannual basis rather than quarterly when flowing. Surface water monitoring is also required when impacts from the landfill to runoff are observed (i.e. leachate seep, exposed waste).

**Comment No. 14**

The MRP Part I.H.1 Groundwater and Surface Water Monitoring Parameters and Table 1 Monitoring are inconsistent with respect to monitoring frequency. County staff request that groundwater monitoring be required semiannually, which is consistent with the current MRP. County staff also request that monitoring not be required during a specific month, but be conducted during the monitoring period. County staff also questions the inclusion of all of the site's groundwater monitoring wells in corrective action and recommend that MW3, MW4, and MW8 be placed in detection monitoring. These wells have historically shown non-detect or occasional trace results for a single compound since the gas collection system was installed in 1997/98.

**Response**

Staff agrees and has modified the relevant sections of Part I.H.1 and Table 1 of the MRP to require semiannual monitoring for detection wells, require quarterly monitoring for corrective action wells, and show MW3, MW4, and MW8 as detection wells. As requested, monitoring is only required during the appropriate period rather than a specific month.

**Comment No. 18**

Attachment 2 of the WDR shows MW6. This well was destroyed as part of the closure of the Landfill. MW6 had been dry since its installation.

**Response**

Finding No. 27 reflects that MW6 is not an active well. Staff has replaced Attachment 2 with an updated version submitted by the Discharger on August 9, 2007.

**Email Comment**

Is a JTD/ROWD required on a closed landfill?

**Response**

Regular submittal of a JTD is not required under CCR Title 27 and staff has modified the WDR to no longer require submittal of the JTD. However, staff has modified the Order to require the Evaluation Report be submitted every five years to help ensure that appropriate modifications to corrective action or monitoring requirements occur in a timely manner. We expect that that new site information or modifications may result in submittal of JTD or Closure Plan amendments.

**COMMENTS AND RESPONSES**

**(Prior to September 7, 2007 Board Meeting)**

**Dr. Chun Chian Lu and Ja Lu, Neighboring Landowner**

Dr. Chun Chian Lu and Ja Lu, neighboring landowners, submitted a comment email dated August 1, 2007, which is included as staff report Attachment 5 and paraphrased below. Staff responses immediately follow the paraphrased comments.

**General Comment**

We have a residential/agricultural property within a couple of miles of the landfill. We would greatly appreciate answers for the concerns we've stated below.

**Comment No. 1**

The chemistry of waste is very complicated due to its composition. It is therefore very hard to determine whether the monitoring time of 30 years is enough as stated by Specification No.14 of the proposed Order. There should be known decay periods for all components in the waste, although its composition may be unknown. Depending on conditions in the landfill (air, water, and temperature) biochemical decay reactions could vary greatly and negative effects could be compounded.

**Response**

Staff agrees and has corrected Specification No. 14 to state "The Post-Closure Maintenance Period and Compliance Period ... is a minimum of thirty years, and shall continue until the Water Board or Executive Officer determines waste discharged at the Landfill no longer poses a threat to water quality..." Originally the specification incorrectly used "or" rather than "and". The thirty year requirement is pursuant to 40 CFR 258.61 The Water Board can shorten the thirty year period only if the "owner or operator demonstrates that the reduced period is sufficient to protect human health and the environment and this demonstration is approved by the [Water Board]." (40 CFR 258.61(b)(1).) The requirement that waste no longer pose a threat to water quality is pursuant to Title 27 Section 20950; see *a/so*, 40 CFR 258.61(b)(2).

**Comment No. 1a**

Are the above factors considered in the design of the final evapotranspirative cover?

**Response**

Pursuant to performance criteria in 40 CFR Parts 257 and 258 and the engineered alternative criteria in Title 27, the Discharger demonstrated that their evapotranspirative cover design would perform equivalent to or better than the prescriptive final cover requirements. The Discharger's Alternative Final Cover Feasibility Study (February 2005) evaluated infiltration performance, stability, maintenance issues, and cost.

**Comment No. 1b**

Will the evapotranspirative cover slow down and control biodegradation, or delay a more serious problem of groundwater contamination.

**Response**

A final cover that reduces the infiltration of water into the waste should result in slower degradation of waste but waste remaining poses a potential threat for a longer period. Fortunately, as intended by regulations, reducing water infiltration significantly reduces the likelihood of contaminant migration from the waste via leachate or landfill gas.

**Comment No. 1c**

The proposed approach seems to be about containment and slow leaching of contaminants into the soil and possibly groundwater. Is this true? The approach seems to be about the delay of a serious problem. Please clarify. (General Finding no. 34, WDR)

**Response**

Older landfills such as Foxen Canyon Landfill were designed and operated prior to current regulatory requirements requiring base liners, leachate collection and removal, and gas extraction. Fortunately, a majority of these landfills, including the Foxen Canyon Landfill, are sited in areas with soil conditions that inhibit the transport of contaminants from the landfill. Clean closure or the removal of waste is rarely an option due to cost and local opposition. For example, Foxen Canyon Landfill has approximately 1.5 million cubic yards of waste disposed and the transport issues (cost, air impact, traffic, etc.) alone would have tremendous impacts on the surrounding communities. Since clean closure does not appear to be an option, closure with an engineered final cover is required. The final cover will reduce the infiltration of water into waste effectively reducing the formation of leachate and landfill gas, which are the primary transport mechanisms for landfill contaminants to groundwater. Please note, landfill closure does not reduce the owner and discharger's ongoing responsibility for the site and any impacts that may occur as a result of the waste contained.

**Comment No. 1d**

With this semi-containment procedure and assumed long percolation decomposition life, wouldn't new "covers" possibly be needed to replace the old one?

**Response**

All covers require maintenance throughout a landfills post-closure period. Some advantages to the evapotranspirative cover are it weathers extremely well due to its required vegetative layer, is generally more stable than other covers with multiple layers, and can be repaired easily.

**Comment No. 2a**

One hundred-fifty feet below ground surface is the groundwater in the perched zones. Emcon & Associates identified seven lithologic zones. Are these pilings [strata] from the bottom up?

**Response**

Finding No. 19 lists the soil stratigraphy beneath the site from youngest to oldest, which is top to bottom. Furthermore, the Quaternary-age alluvium is the top-most layer, although a majority of the alluvium beneath the landfill was removed prior to waste placement.

**Comment No. 2b**

What is the minimum depth assumed for the area of the waste disposal? One hundred-fifty feet is very shallow. Our well at 3130 Foxen Canyon Road is about this depth, which is at the bottom of the valley near the landfill site.

**Response**

The method of disposal at the Landfill was area-fill, where waste is placed in thin layers compacted and covered by daily cover. Since the majority of the alluvium beneath the disposal area was removed prior to waste placement, the depth could potentially be the original thickness of the alluvium, reportedly up to 18 feet. A more accurate method of referencing depth or height at the bottom of the disposal area would be via feet above mean sea level (ft-msl). However, without a survey reference height for your well it is difficult to compare. For your information the toe or base of the landfill is 940 ft-msl and the depth to groundwater at the site is approximately 225 feet; although, there are localized perched zones at more shallow depths.

**Comment No. 3**

What is the depth of existing or future monitoring wells? "The levels shown in MW10 indicate that levels of PCE appear to naturally attenuate prior to moving much further downgradient," (Page 6, Staff Report). Please clarify in more detail.

**Response**

Based on the Discharger's February 2007 Semiannual Monitoring Report, monitoring well information is shown in the following table:

	Top Casing Height (ft-msl)	Well Depth (ft)	Groundwater Elevation (ft-msl)
MW-3	1023.4	305	774
MW-4	946.9	314	674
MW-8	997.5	406	662
MW-9	944.0	18	Dry*
MW-10	931.3	40.6	Dry**

\* Last sample collected in 1998.

\*\* Last sample collected in 2005.

Staff has removed the statement on page 6 of this staff report regarding PCE appearing to naturally attenuate, preferring to defer any conclusions until review of the Discharger's Evaluation Report has been completed. This report will assess the current monitoring network, corrective actions taken, and shall recommend improvements, if necessary. The first Evaluation Report is due January 31, 2008 and every five years thereafter.

**Comment No. 4**

Why and how does PCE disappear from the groundwater?

**Response**

PCE can undergo slow biodegradation in anaerobic conditions when microorganisms have been acclimated. Additionally, PCE can naturally attenuate through physical and chemical processes such as dilution, adsorption, and diffusion.

**Comment No. 4a**

Is it by diffusion? We believe some wells have to be in the middle of the waste area, where the release is more serious, not only at the perimeters where the release has gone and disappeared.

**Response**

Installing wells through waste and down to groundwater would potentially result in a direct conduit for leachate to impact groundwater. Leachate currently has to travel through approximately 150 feet of low permeability soil before reaching significant perched zones; and 250 feet of low-permeability soil to first reliable water-bearing zone (Zone D according to Emcon and Associates, 1992). Additionally, the point of compliance is defined by Title 27 as a vertical surface located at the hydraulically downgradient limit of a waste management unit and that extends through the uppermost aquifer underlying the unit. It is possible that future corrective actions may be necessary to address issues you have discussed.

**Comment No. 5**

Fairly detailed test plans are to be implemented onsite, but no plan for correcting the discharged release of hazardous chemicals or contamination is planned. To date only gas collection has been utilized as a corrective action. Water contamination is much more serious and harder to correct, because it is more widespread and includes not only the Santa Ynez valley but also Santa Barbara.

**Response**

Given the observed impacts, current corrective action has focused on the identified mechanism for groundwater impacts, which is migration of VOC-laden landfill gas and allowing for natural attenuation of low level impacts. The Order requires that monitoring continue, be regularly evaluated to determine the effectiveness of both monitoring and corrective action, and requires improvements be proposed when necessary.

**Comment No. 6**

The potential financial effects and impacts on lives are great. In the whole report there is only one sentence related to the financial responsibility, obviously underestimates the importance of the current and future issues. "Any noncompliance which threatens the landfill's containment integrity shall be promptly corrected. Correction schedules are subject to the approval of the Executive Officer..." (Reporting No. 23, WDR) There should be reports on the landfill sent out to the neighboring properties on a quarterly (or less) basis.

**Response**

Closure of the landfill does not reduce the owner and discharger's responsibility for the site and any impacts that may occur as a result of the waste contained. Provision No. 26 requires that the Discharger maintain financial mechanisms to cover estimated costs for initiating and completing corrective action of all known or reasonable foreseeable releases from the landfill through the post-closure maintenance period.

Your request that neighboring properties receive reports on a quarterly or more frequent basis is inconsistent with the requirements of the Monitoring and Reporting Program. Our files are

available for public review and include formal correspondence, plans, and/or reports related to the site. Additionally, Santa Barbara County has often voluntarily provided neighbors or other interested parties with copies of reports, so we recommend you contact them. We will also relay your request to the County and include you on any correspondence related to the Evaluation Report due in January 2008.

**Comment No. 7**

Has the city [County] been monitoring water quality for the Los Olivos area, especially the areas south and southeast of the landfill, including rivers/creeks since the inception in 1970?

**Response**

County staff have monitored a private supply well approximately 1 mile downgradient that has consistently had no detected VOCs. This information is available to the public, if requested. In general, public water providers are required to regularly sample their supply water pursuant to California Department of Health Services and local County Environmental Health Department guidelines. Regarding rivers/creeks to the south and southeast of the landfill, the Water Board is not aware of any regular monitoring of these water bodies except for required periodic monitoring of storm water leaving the site.

**Comment No. 8**

If the landfill soil below the landfill cracked (too much rain, earthquake, etc.), does this mean an increased chance of contaminated water wells/soils/groundwater for the homes in the area?

**Response**

The Foxen Canyon Landfill is approximately 1 mile from the Los Alamos fault, 8 miles from the Santa Ynez fault, and 9 miles from the Nacimiento Fault. Cracking of the soil below the landfill is not expected as soil borings and excavations near the landfill have not shown significant fractures or joints within the Paso Robles Formation. The waste also exerts a downward confining pressure on soil directly below it. Although cracking has not been observed, the underlying sediments do dip towards the southwest at approximately 5 degrees, which can significantly influence the gradient of perched groundwater.

Cracking also arises from desiccation of expansive clays. This is generally only a problem with shallow units. The final cover does include some expansive soils; however, the County does not expect desiccation to be an issue with the final cover because historical observation of the interim cover, which was built with similar soils, did not show evidence of cracking. Furthermore the Discharger is required to maintain and repair the final cover if cracking or other deficiencies occur.

Landslides potentially cause cracking but have not been observed at the site. To prevent landslides involving the waste the landfill's final elevation, slopes, and benches were designed with specific stability criteria.

**Comment No. 9**

How would the city prevent such cracks or fissures in the ground?

**Response**

The County does not expect to have to prevent cracking or fissures in the ground based on the site conditions discussed above. It has however taken steps to prevent cracking in the final cover by designing with seismic-based criteria and is required to maintain and repair the final cover if cracking or other deficiencies occur.

**Comment No. 10**

Is capping truly the only method to maintain the landfills stability?

**Response**

Both State and Federal requirements require a final cover during formal closure of a landfill. The primary purpose of the final cover is to contain and prevent infiltration of water into the waste. In proposing, designing, and building the final cover the discharger did address seismic stability. Stability of the landfill is also affected by the height of the landfill and the design of the slopes and benches related to that height.

**Comment No. 11**

Is capping the least expensive method to maintain the landfills stability?

**Response**

The final cover is required and the evapotranspirative cover appears to offer greater performance, cost savings, easier maintenance, and greater seismic stability when compared to a Title 27 prescriptive final cover.

**Comment No. 12**

It seems the landfill area of under 19 acres is small and more extreme measures of containment should be manageable by the cities that used this landfill. The potential hazards are great for an area with a lot of agriculture, livestock, schools, retail, and high-end homes. The monitoring program and corrective action program is due to be evaluated in January 2008.

**Response**

This Landfill was sited, designed, and developed before current regulatory requirements. The final cover as designed and installed complies with current regulatory requirements. The cover is expected to contain and minimize infiltration of water into the waste, reducing the formation of leachate and landfill gas. The Water Board's goal is protect all the beneficial uses for groundwater in the area, which include domestic, agricultural, and industrial water supply. Any corrective action taken is required to address and protect these uses.

**Comment No. 13**

Preventative measures should have been done from the beginning, such as lining the base and capping layers with fill.

**Response**

Although current law requires base liners and leachate collection and removal systems, they were not required when Foxen Canyon Landfill was sited and developed. New landfills and new waste disposal cells at old landfills are required to install protective barriers and systems to contain and control waste.

**County of Santa Barbara Public Works Department**

The Discharger submitted a comment letter dated August 2, 2007, which is included as staff report Attachment 6 and paraphrased below. Staff responses immediately follow the paraphrased comments.



**Comment No. 1**

WDR Attachment 3 should be omitted as it is redundant and contains several items that are obsolete or inaccurate.

**Response**

Staff has replaced Attachment 3 with an updated Attachment 2 submitted by the Discharger on August 9, 2007.

**Comment No. 2**

Regarding Finding No. 29, first bullet, replace the second consistently with sporadically. Well MW-10 is frequently dry and is therefore not consistently sampled; however of the thirteen times it has been historically sampled, PCE has been detected eight times and always below the MCL of 5 µg/L.

**Response**

Staff agrees and has replaced and included the language as recommended.

**Comment No. 3**

To clarify Finding No. 29, second bullet, insert "Provision E.27 of" before "This order requires...".

**Response**

Staff agrees and has added the proposed language to clarify Finding No. 29.

**Comment No. 4**

Regarding Provision No. 12, the Discharger operates this facility on leased land; we therefore have no ability to implement this provision regarding a recorded notice on the deed.

**Response**

Provision No. 12 requires the owner to record a deed notification or equivalent mechanism for the site. Please note, staff expects the County to help provide the appropriate documents (maps, landfill specifics, etc) to the Chamberlin Trust [Owner] to help facilitate compliance with Provision No. 12.

**Comment No. 5**

The compliance date of June 30, 2007, found within Provision No. 26 and its respective cell within the Report and Implementation Date Summary Table of the Order has already passed; please revise to a reasonable time following the September 7, 2007 hearing date.

**Response**

Staff has updated the date to June 30, 2008, which is consistent with when the Discharger submits Financial Assurance updates to the California Integrated Waste Management Board.

**Comment No. 6**

Attachment No. 2 should be revised to eliminate MW-6 since this was a dry well that has been destroyed, and MW-2 which is a dry well that is not a part of the monitoring program. Also, the location of the waste footprint is not accurate in relation to the property lease boundary and well locations.

**Response**

Staff has replaced Attachment 2 with an updated version submitted by the Discharger on August 9, 2007.

**Comment No. 7**

Part I.E. and Part III.A.5 of the Monitoring and Reporting Program (MRP) require long-term monitoring of the performance of the evapotranspirative (ET) cover that was recently constructed at the Foxen Canyon Landfill. We believe that performance monitoring of the ET cover constructed at the Landfill is not necessary for the following reasons:

- The ET cover proposed was developed as an alternative to the Title 27 prescriptive cover requirements. The ET cover was designed using methods used, recommended, and/or approved by the engineering profession, regulatory agencies, and/or research organizations. The ET cover was developed using site-specific climatic and soil engineering properties to simulate site specific soil moisture percolation conditions. The results of the design effort indicate that the predicted percolation in the ET cover is less than half the percolation predicted for the Title 27 prescriptive cover. Therefore, the ET cover will “isolate the waste in the unit from precipitation and irrigation waters at least as well as would a final cover built in accordance with applicable prescriptive standards” in compliance with the requirements of CCR Title 27 Section 21090.
- Numerous intensively instrumented and monitored field scale test sites have been constructed and evaluated by the Alternative Cover Assessment Program (ACAP) demonstrating the applicability and limitations of alternative landfill covers. Over twenty full scale ET covers have been designed and/or constructed in CA over the past ten to fifteen years. To date, over twelve ET covers have been constructed and approved as final covers by various California Regional Water Quality Control Boards. Available monitoring and modeling data for these projects indicate that ET covers performed as expected and exhibit a lower percolation rate than the Title 27 prescriptive covers. U.S. EPA staff stated that “ET covers are equivalent or superior to clay in all areas” and “ET covers are predictable” in a presentation summarizing the results of the ACAP.
- While soil moisture monitoring systems have proven to be useful for agricultural purposes, their accuracy and reliability has proven to be a challenge when these systems are used to monitor moisture migration and to quantify percolation in ET covers. This later concern was raised by Dr. William Albright of the Desert Research Institute and principal investigator of the ACAP.

Therefore, because much data have been generated supporting the superior performance of ET covers over that of the Title 27 prescriptive cover and because of the limitations of available soil moisture monitoring systems, it is the position of Santa Barbara County that the acceptance of the alternative cover for the Landfill be based on design studies, percolation modeling using site specific climatic data and soil properties, borrow source investigations, and construction quality assurance procedures, which have been previously submitted to and approved by the RWQCB in accordance with CCR Title 27 Section 21090. In this regard, it is suggested that Part I.E. and Part III.A.5 should be omitted from this MRP.

**Response**

Staff agrees in part, and believes it may be more appropriate to focus on improvements to groundwater monitoring or corrective actions at the site as recommended in the Evaluation Report due January 2008. Improvements in the monitoring network would positively impact the Discharger's ability and the Water Boards confidence in detection of, and measuring impacts to groundwater during the post-closure maintenance period. Staff has modified the MRP to require the Evapotranspirative Cover Performance Monitoring to start in 2009; this should give time for assessment and implementation of the Evaluation Report and modification of the MRP, if necessary.

Please note, despite the county's arguments against direct measurements of moisture conditions within the cover, we believe that soil moisture monitoring is a useful quality assurance and quality control tool. The following are a several points in support of the moisture monitoring program:

- 1) County's first bullet. Although the evapotranspirative cover was designed and approved pursuant to CFR 257 and 258, and Title 27 requirements, the Water Board has the authority pursuant to Title 27 Section 20080(a)(1) to impose more stringent requirements to accommodate regional and site-specific conditions. The fact that the Foxen Canyon Landfill does not have base liner or a leachate collection and removal system could be basis for more stringent monitoring of the final cover, whether it was a prescriptive or, as designed, the evapotranspirative cover. For example, a prescriptive cover contains a constructed low permeability layer, which is known to have significant desiccation issues in arid environments; therefore, additional monitoring to address potential desiccation may have been required.
- 2) County's second bullet. We agree with these statements but note that other regions have (and some still do require) performance monitoring or design evaluation with test pads, lysimeters, and moisture sensor devices. We also note that most of the twelve ET covers stated as approved by other Regional Boards are for sites located in more arid climatic conditions.
- 3) County's third bullet. Since moisture sensors have been used to demonstrate performance in many of the cited success stories, this argument appears circular in nature. We do agree that moisture sensors may have some accuracy limitations. However, the data can be evaluated and should provide valuable site-specific empirical information, which can summarize water movement trends through the cover or be reapplied into the original (or improved) design model for a more detailed assessment.

### **Chamberlin Trust**

Staff discussed the proposed Order and specifically Provision No. 12 with Willy Chamberlin, by phone, on August 3, 2007. Mr. Chamberlin had no specific comments on the proposed Order, except concurrence was contingent upon Provision 12 containing the language in the proposed Order. That language has been retained.

### **Water Board Staff**

#### **Edit No. 1**

Water Board staff has modified Finding No. 1 of the WDR to clarify the relationship between the County of Santa Barbara and the Chamberlin Trust. Finding No. 1 defines the County of Santa Barbara as "County" and the Chamberlin Trust as "Owner" and defines the County and Owner as "Discharger". The Order specifically states that the Waste Discharge Requirements apply to both the County and Owner, which is consistent to existing Waste Discharge Requirements 94-32.

#### **Edit No. 2**

Water Board staff has modified Provision No. 12, which previously just referred to a filing with the County Recorder upon closure of the Landfill. The Provision now is more specific requiring the Owner to file a deed notification or equivalent mechanism, which must in perpetuity notify any potential purchaser of the property that:

- a. The land has been used as a landfill.

- b. The land use is restricted by the approved post-closure maintenance plan, pursuant to Title 27, Section 21170. The deed notation must include all information required by Section 21170.
- c. Pursuant to Title 27, Section 21090, should the Discharger default in post-closure care, liability shifts to the new owner/operator.

**Edit No. 3**

Water Board staff has added Provision No. 26, which requires the Discharger to maintain financial assurance instruments

**Edit No. 4**

Water Board staff has added Finding No. 40, which states why technical reports or monitoring reports are required by the Order.

**Edit No. 5**

Water Board staff has added Provision No. 28, which requires submittal of an updated Final Closure and Post-Closure Maintenance Plan by September 30, 2010, and every five years thereafter.

**RECOMMENDATION**

Adopt revised Waste Discharge Requirements Order No. R3-2007-0027 as proposed.

**ATTACHMENT**

1. Proposed Waste Discharge Requirements Order No. R3-2007-0027 (Includes Order Attachments 1-4 and MRP No. R3-2007-0027)
2. De Werd Family letter, dated March 16, 2007
3. County of Santa Barbara Department of Public Works letter, dated March 22, 2007
4. County of Santa Barbara Environmental Health Services email, dated March 22, 2007
5. Dr. Chun Chian Lu and Ja Lu email, dated August 1, 2007
6. County of Santa Barbara Department of Public Works letter, dated August 2, 2007